Practice Problems for Sect. 4.3 **ANSWER KEY**

1) a. $\int_{-4}^{-2} f(x)\,dx$ = Area under curve $(-4, -2)$

$\frac{1}{2}bh \rightarrow \frac{1}{2}(2)(1) = \boxed{1}$

b. $\int_{-2}^{2} f(x)\,dx = \pi r^2 = \pi(2)^2 = \boxed{4\pi}$

c. $\int_{2}^{4} f(x)\,dx = \frac{1}{2}bh = \frac{1}{2}\cdot 2\cdot 2 = \boxed{2}$

2) a. $\int_{0}^{5}[f(x)+2]\,dx = \int_{0}^{5} f(x)\,dx + \int_{0}^{5} 2\,dx = 4 + 2\int_{0}^{5} dx = 4+10 = \boxed{14}$

b. $\int_{-2}^{3} f(x+2)\,dx = \int_{0}^{5} f(x)\,dx = \boxed{4}$

c. $\int_{-5}^{5} f(x)\,dx = 2\int_{0}^{5} f(x) = \boxed{8}$

f is even

d. $\int_{-5}^{5} f(x)\,dx = \int_{0}^{5} f(x)\,dx - \int_{0}^{5} f(x)\,dx = \boxed{0}$

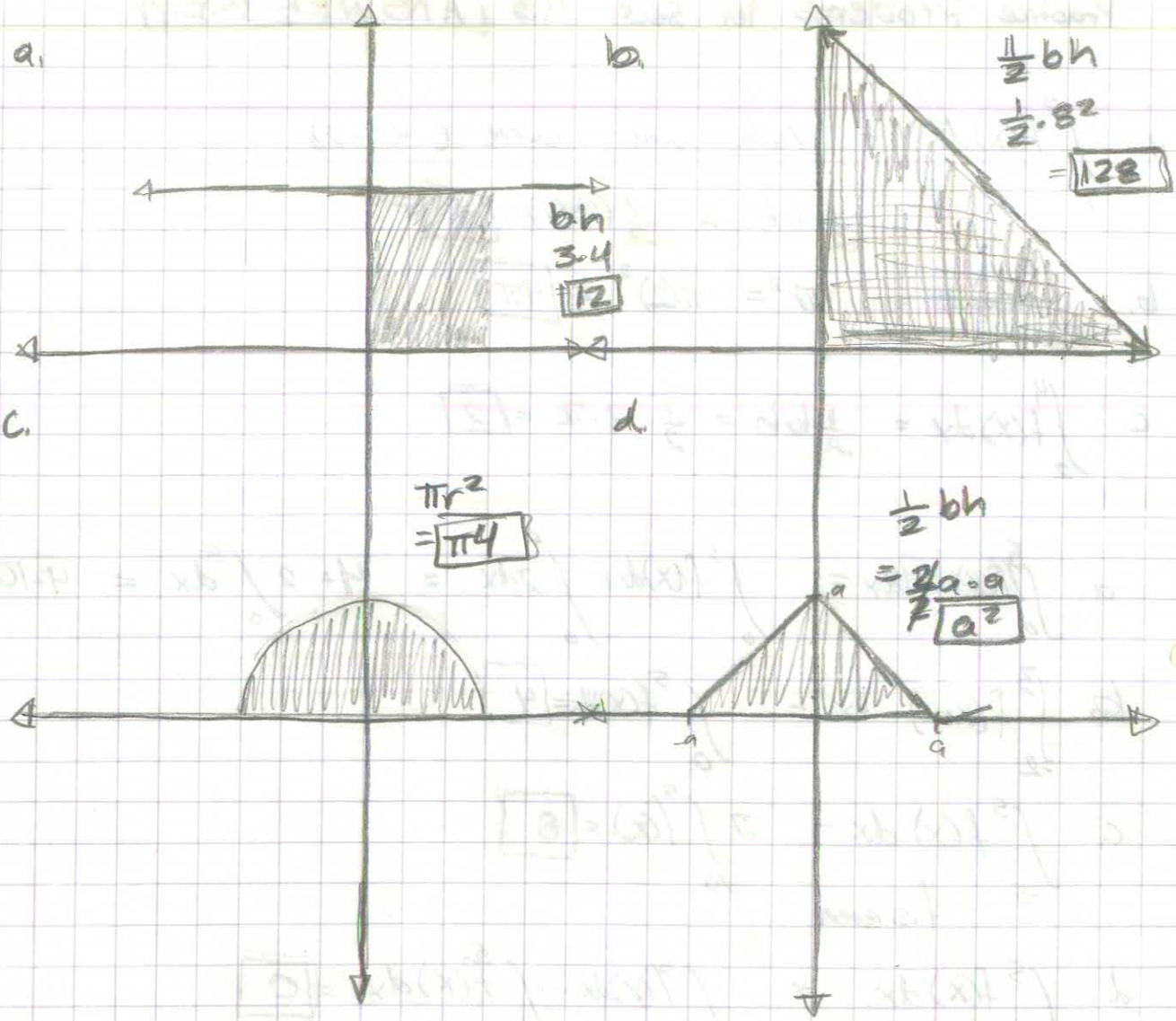
f is odd

3) a. $\int_{1}^{e} \left(\frac{1}{x}\right)dx = \ln(x)\Big]_{1}^{e} = \ln(e) - \ln(1) = 1 - 0 = \boxed{1}$

b. $2\int_{1}^{16} \frac{x^2}{\left(\frac{1}{3}\right)}dx$ = Evaluate w/ calc $= 2\left(x^3\right)\Big]_{1}^{16}$

$2\left(16^3 - 1\right) = \boxed{8190}$

4)



5) a. $\int_{-1}^{0} f(x)dx = \int_{-1}^{1} f(x)dx - \int_{0}^{1} f(x)dx = 0 - 5 = \boxed{-5}$

b. $\int_{0}^{1} f(x)dx - \int_{-1}^{0} f(x)dx = \int_{0}^{1} f(x)dx + 5 = \boxed{10}$

c. $\int_{-1}^{1} 3f(x) = 3\int_{-1}^{1} f(x)dx = 3(0) = \boxed{0}$

d. $\int_{0}^{1} 3f(x)dx = 3\int_{0}^{1} f(x)dx = 3(5) = \boxed{15}$